GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

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# NARRATIVE

TO: Jeng-Hon Su

FROM: Nada Osman

DATE: November 30, 2022

| | |
|---|---|
| Facility Name: | **Battle Lumber Company** |
| AIRS No.: | 04-13-163-00012 |
| Location: | Wadley, GA (Jefferson County) |
| Application #: | 28592 |
| Date of Application: | October 15, 2022 |

## Background Information

Battle Lumber Company (hereinafter "facility") operates a lumber mill at 11261 Highway 1 Bypass in Wadley, Georgia. The facility is located in Jefferson County, which is an attainment county for all criteria air pollutants. Equipment at the facility currently includes three sawdust-fired boilers with three multi-clones, seventeen steam-heated batch lumber kilns, three debarkers, four chippers, a grade mill, a timber mill, a planer mill, a pallet mill, a green silo, a dry silo, and nine conveyance cyclones.

Operations at the facility begin with green logs, which are sent to the debarkers (ID Nos. DB01-DB03) to be stripped of their bark, which is then processed into mulch to be sold or used on site. The debarked logs are then sent to the sawmills (ID Nos. SM01 and SM02) to be cut into rough dimensioned lumber. The dimensioned lumber is then sent to either the batch drying kilns (ID Nos. DK01-DK17) or the pallet mill (ID No. PM01). Dried lumber from the kilns is sent to the planer mill (ID No. PM02) to be processed into specified dimensioned lumber and then sold. Green lumber at the pallet mill is cut into specified dimensioned slabs and assembled into pallets to be sold.

The kilns (ID Nos. DK01-DK17) are powered by steam from three sawdust-fired boilers (ID Nos. B1 - B3), whose emissions are controlled by three multiclones (ID Nos. MC01-MC03). Two chippers (ID Nos. CH01 and CH02) process scraps from the sawmills (ID Nos. SM01 and SM02) and one chipper (ID No. CH03) processes scraps from the pallet mill (ID No. PM01). Dry shavings and sawdust from the manufacturing processes are collected by a number of cyclones (ID Nos. CY01-CY09) and pneumatically conveyed into piles to be sold. Some of the dry shavings and sawdust are conveyed to the dry silo (ID No. SL02) to be used for fuel for the boilers.

The facility currently operates with a rolling twelve-month production limit of 32.5 million board-feet (MMbf) of pine lumber, as well as a processing limit of 800,000 tons of both pine and hardwood lumber combined, in order to keep volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions below their respective Title V major source thresholds. Therefore, the facility is currently considered a synthetic minor source. All criteria air pollutants and single and combined HAP are below their respective major source thresholds.

The facility currently operates under Permit No. 2421-163-0012-S-03-0, issued on July 24, 2018.

## Purpose of Application

On October 15, 2022, the facility submitted Application No. 28592 for the installation of a new continuous drying kiln (ID No. DK18) and a 28.7 MMBtu/hr sawdust-fired boiler (ID No. B4) and its associated multiclone (ID No. MC04). The modification also includes the replacement of three existing chippers (ID Nos. CH01-CH03) with one new chipper (redesignated ID No. CH03) and the renaming of existing Chippers CH04 and CH05 to Chippers CH01 and CH02, respectively. Installed cyclones not included in previous permits are also included in this permit.

The application also proposes a pine lumber drying limit of 71 MMbf/yr and a hardwood lumber drying limit of 148.5 MMbf/yr in all kilns, combined, in order to keep facility-wide HAP emissions below Title V major source levels and to keep facility-wide VOC emissions below the Prevention of Significant Deterioration (PSD) major source level. After the modification, the facility will become a Title V major source because emissions of carbon monoxide (CO), particulate matter (PM), and VOC will be each be above 100 tons per year (tpy).

## Updated Equipment List

**Table 1: Equipment List**

| Emission Units | | Associated Control Devices | |
|---|---|---|---|
| **Source Code** | **Description** | **Source Code** | **Description** |
| DK01-DK17 | Batch Drying Kilns Nos. 1-17 | -- | -- |
| **DK18** | **Continuous Dry Kiln No. 18** | -- | -- |
| DB01-DB03 | Debarkers | -- | -- |
| SM01 | Grade Mill | CY01<br>CY02<br>CY03 | Cyclone 1<br>Cyclone 2<br>Cyclone 3 |
| SM02 | Timber Mill | CY04 | Cyclone 4 |
| SH01 | Sawmill Hog | -- | -- |
| PM01 | Pallet Mill | CY05<br>CY06 | Cyclone 5<br>Cyclone 6 |
| PM02 | Planer Mill/Lumber Grading | CY08 | Cyclone 8 |
| PA01 | Pallet Assembly | -- | -- |
| CH01 | Grade Mill Chipper (renamed from CH04) | -- | -- |
| CH02 | Timber Mill Chipper (renamed from CH05) | -- | -- |
| **CH03** | **Pallet Mill Chipper** | CY07 | Cyclone 7 |
| SL01 | Sawmill Green Silo | -- | -- |
| SL02 | Dry Silo | CY09 | Cyclone 9 |

**New emission units are in bold**

**Table 2: Fuel Burning Equipment**

| Source Code | Input Heat Capacity (MMBtu/hr) | Description | Associated Control Device | |
|---|---|---|---|---|
| | | | Source Code | Description |
| B1 | 9.6 | Green sawdust-fired Boiler | MC01 | Multiclone |
| B2 | 28.7 | Green sawdust-fired Boiler | MC02 | Multiclone |
| B3 | 28.7 | Green sawdust-fired Boiler | MC03 | Multiclone |
| **B4** | **28.7** | **Green sawdust-fired Boiler** | **MC04** | **Multiclone** |

**New emission units are in bold**
B1 will be decommissioned after B4 starts operation.

## Emissions Summary

After the modification, potential emissions of PM, CO, and VOC will each exceed the 100 tpy major source threshold, making the facility a Title V major source. The existing throughput limits will be replaced with a pine lumber drying limit of 71 MMbf/yr and a hardwood lumber drying limit of 148.5 MMbf/yr in all kilns, combined. These drying limits will keep facility-wide single/combined HAP emissions below 10/25 tpy and will keep facility-wide VOC emissions below the 250 tpy PSD major source threshold.

Emissions calculations are based on the pine and hardwood throughput limits (71 MMbf/yr and 148.5 MMbf/yr, respectively) and 8,760 hours per year of operation.

**Table 3: Facility-wide Emissions (tpy)**

| Pollutant | Potential Emissions | | | Actual Emissions | | |
|---|---|---|---|---|---|---|
| | Before Mod. | After Mod. | Emissions Change | Before Mod. | After Mod. | Emissions Change |
| $PM/PM_{10}/PM_{2.5}$ | 93.4 | 141.9 | 48.5 | 93.4 | 128.0 | 34.6 |
| NOx | 64.6 | 83.0 | 18.4 | 64.6 | 83.0 | 18.4 |
| $SO_2$ | 7.3 | 9.4 | 2.1 | 7.3 | 9.4 | 2.1 |
| CO | 93.7 | 143.9 | 50.2 | 93.7 | 143.9 | 50.2 |
| VOC | 96.6 | 175.0 | 78.4 | 96.6 | 175.0 | 78.4 |
| Max. Individual HAP | 3.8 | 9.9 | 6.1 | 3.8 | 9.9 | 6.1 |
| Total HAP | 4.2 | 22.2 | 18.0 | 4.2 | 22.2 | 18.0 |
| Total GHG (if applicable) | 55,788 | 79,027 | 23,239 | 55,788 | 79,027 | 23,239 |

**Regulatory Applicability**

*40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*

Because Boilers B2, B3, and B4 have a heat input capacity between 10 and 100 MMBtu/hr and were constructed after June 9th, 1989, they are subject to Subpart Dc. No emission or opacity standards apply to the boilers. The facility must maintain monthly fuel consumption records for Boilers B2, B3, and B4.

Since Boiler B1 has a heat input capacity less than 10 MMBtu/hr, it is not subject to 40 CFR 60 Subpart Dc.

*40 CFR 63 Subpart DDDD – NESHAP for Plywood and Composite Wood Products*

40 CFR 63 Subpart DDDD potentially applies to facilities that operate lumber drying kilns and that are major sources of HAP emissions. The facility is a minor source of HAP emissions, and therefore, the subpart does not apply.

*40 CFR 63 Subpart JJJJJJ – NESHAP for Industrial, Commercial, and Institutional Boilers for Area Sources*

Because the facility is a minor source of HAP emissions, Boilers B1, B2, B3, and B4 are subject to 40 CFR 63 Subpart 6J. Boiler B1 is required to undergo biennial tune-ups per Item 6. of Table 2 to 40 CFR 63 Subpart JJJJJJ. Because they are equipped with oxygen trim systems, Boilers B2, B3, and B4 are required to undergo tune-ups every five years per Item 14. of Table 2 to 40 CFR 63 Subpart JJJJJJ.

Existing biomass-fired boilers must also complete an initial tune-up as specified in 40 CFR 63.11214(b); although Boiler B4 is expected to be installed in 2023, it was constructed before June 4th, 2010, and will be renovated. The fixed capital cost of the boiler's new components is less than 50% of the fixed capital cost of purchasing a new equivalent boiler, making Boiler B4 an existing source. Per Item 16. of Table 2 to 40 CFR 62 Subpart JJJJJJ, Boiler B4, as existing biomass-fired boiler, must also undergo a one-time energy assessment performed by a qualified energy assessor.

*Georgia Rule 391-3-1-.02(2)(b), Visible Emissions*

GA Rule (b) limits visible emissions from manufacturing processes to no more than 40% opacity. Significant PM emissions are not expected from operation of lumber drying kilns (including the new Continuous Kiln DK18), and much of the PM emissions produced from woodworking will be collected by the conveyance cyclones (ID Nos. CY01-CY09). Therefore, the facility is expected to comply with the limits of Georgia Rule (b).

*Georgia Rule 391-3-1-.02(2)(d), Fuel-Burning Equipment*

Georgia Rule (d)2.(i) limits the opacity and rate of emission of PM from fuel burning equipment with a capacity less than 10 MMBtu/hr, and Georgia Rule (d)2.(ii) limits the opacity and rate of emission of PM from fuel burning equipment with a capacity between 10 MMBtu/hr and 250 MMBtu/hr. Emissions from all boilers are controlled by multiclones. Therefore, all boilers are expected to comply with both the PM emission limit and visible emission limit of Georgia Rule (d).

*Georgia Rule 391-3-1-.02(2)(e), Particulate Emissions from Manufacturing Processes*

Georgia Rule (e) limits the emission of PM from all manufacturing processes according to the following equations:

$E = 4.1 * P^{0.67}$ for process input weight rate up to and including 30 tons per hour.
$E = 55 * P^{0.11} - 40$ for process input weight rate above 30 tons per hour.

Where E equals the allowable PM emission rate in pounds per hour and P equals the process input weight rate in tons per hour.

Compliance with the GA Rule (e) PM emission standards is expected as follows.

**Table 4: GA Rule (e) Compliance***

| Name/ID No. | Process Input Weight Rate (P) (tons/hr.) | Allowable Emission Rate (E) (lbs. PM / hr.) | Max PM Emission Rate of Unit (lb/hr) | Max < Allowable? |
|---|---|---|---|---|
| Kilns DK01-DK06, DK13, and DK14 | 2.5 | 7.6 | 0.18 | YES |
| Kilns DK07-DK12 | 3.3 | 9.0 | 0.23 | YES |
| Kilns DK15-DK16 | 4.0 | 10.4 | 0.28 | YES |
| Kiln DK17 | 4.7 | 11.6 | 0.33 | YES |
| Kiln DK18 | 11.0 | 20.5 | 0.77 | YES |
| Debarkers DB01-DB03 | 62.2 | 46.6 | 8.7 | YES |
| Sawmill Hog SH01 | 28.0 | 38.2 | 2.0 | YES |
| Chipper CH01 | 8.3 | 16.93 | 0.58 | YES |
| Chipper CH02 | 15.5 | 25.7 | 1.1 | YES |
| Chipper CH03 | 4.2 | 10.7 | 0.29 | YES |
| SM01 | 55.5 | 45.6 | 3.89 | YES |
| SM02 | 103.1 | 51.6 | 7.21 | YES |
| PM01 | 27.8 | 38.0 | 1.95 | YES |
| PM02 | 42.4 | 43.1 | 2.97 | YES |

*calculations are for each individual emission unit

*Georgia Rule 391-3-1-.02(2)(g), Sulfur Dioxide*

Georgia Rule (g) limits fuel-burning sources with a heat input capacity less than 100 MMBtu/hr to burning fuels containing less than 2.5 percent sulfur. The boilers fire only green sawdust, which has a fuel sulfur content of much less than 2.5%. Therefore, compliance with the fuel sulfur limits of Georgia Rule (g) is expected.

*Georgia Rule 391-3-1-.02(2)(tt), VOC Emissions from Major Sources*

Georgia Rule (tt) limits VOC emissions from major sources. The facility is located in Jefferson County, which is not one of the named counties subject to the requirements of Georgia Rule (tt). Therefore, it does not apply.

**Permit Conditions**

Condition 2.1 restricts the facility to processing no more than 71 MMbf/yr of pine lumber in all of the kilns, combined, for HAP Title V avoidance and VOC PSD avoidance.

Condition 2.2 restricts the facility to processing no more than 148.5 MMbf/yr of hardwood lumber in all of the kilns, combined, for HAP Title V avoidance and VOC PSD avoidance.

Condition 2.3 subjects Boilers B2, B3, and B4 to 40 CFR 60 Subpart Dc, "NSPS for Small Industrial-Commercial-Institutional Steam Generating Units."

Condition 2.4 subjects Boilers B1, B2, B3, and B4 to 40 CFR 63 Subpart 6J, "NESHAP for Area Sources: Industrial, Commercial, and Institutional Boilers."

Condition 2.5 restricts visible emissions from manufacturing equipment to no more than 40% opacity, per GA Rule (b).

Condition 2.6 limits PM emissions from fuel burning equipment, per GA Rule (d).

Condition 2.7 limits PM emissions from manufacturing equipment based on process input weight rate, per GA Rule (e).

Condition 2.8 restricts the facility to firing only wood in all boilers at the facility, subsuming the GA Rule (g) fuel sulfur requirement.

Condition 5.1 requires the facility to perform operation and maintenance checks on all of the cyclones (ID Nos. CY01-CY09) and the multiclones (ID Nos. MC01-MC04).

Condition 5.2 requires the facility to conduct biennial tune-ups on Boiler B1 to demonstrate compliance with 40 CFR 63 Subpart 6J.

Condition 5.3 requires the facility to conduct an initial performance tune-up of Boiler B4 to demonstrate compliance with 40 CFR 63 Subpart 6J.

Condition 5.4 requires the facility to conduct a tune-up for Boilers B2, B3, and B4 every five years to demonstrate compliance with 40 CFR 63 Subpart 6J.

Condition 7.1 requires the facility to record and maintain monthly records of the amount of each fuel combusted in Boilers B2, B3, and B4.

Condition 7.2 requires the facility to submit a Notification of Compliance Status to the Division within 120 days after the initial startup of Boiler B4 that certifies that B4 has undergone an initial tune-up and energy assessment, per 40 CFR 63 Subpart 6J.

Condition 7.3 requires the facility to prepare a compliance report for each of the boilers for each tune-up period.

Condition 7.4 contains the 40 CFR 63 Subpart JJJJJJ requirements for maintaining records for all of the boilers.

Condition 7.5 requires the facility to maintain monthly records of the amount of pine lumber processed through all of the kilns, combined, and the amount of hardwood lumber processed through all of the kilns, combined.

Condition 7.6 requires the facility to notify the Division if the monthly amount of pine lumber processed in the kilns exceeds 5.91 MMbf.

Condition 7.7 requires the facility to calculate, each month, a 12-month consecutive total of the amount of pine lumber processed in all of the kilns, combined, and to notify the Division if any 12-month total exceeds 71 MMbf.

Condition 7.8 requires the facility to notify the Division if the amount of hardwood lumber processed through all of the kilns, combined, exceeds 12.3 MMbf during any calendar month.

Condition 7.9 requires the facility to calculate, each month, a 12-month consecutive total of the amount of hardwood lumber processed in all of the kilns, combined, and to notify the Division if any 12-month total exceeds 148.5 MMbf.

Condition 7.10 requires the facility to submit written notification of startup of Boiler B4 to the Division within 15 days of said startup.

Condition 8.3 requires the facility to submit a Part 70 Operating Permit application to the Division within 12 months after the issuance date of this permit.

## Toxic Impact Assessment

In order to comply with Georgia Air Toxics Guidelines, the facility performed a Toxic Impact Assessment on eight key TAP; acetaldehyde, acrolein, arsenic, chromium VI, formaldehyde, hydrogen chloride, methanol, and phenol. Because the facility's emission points are not vertical point sources, the minimum emission rate (MER) method cannot be used to determine whether the TAPs require modeling. The maximum ground level concentration (MGLC) for each TAP was modeled in AERMOD and compared to its corresponding acceptable ambient concentration (AAC). AAC values for each TAP were referenced from Appendix A of the Summary of Ambient Impact Assessment of Toxic Air Pollutant Emissions (2018). The annual MGLC for arsenic exceeded its associated AAC.

**Table 5: AERMOD MGLC vs. AAC**

| Pollutant | CAS | Averaging Period | AAC ($\mu g/m^3$) | Max Modeled Concentration (MGLC) | MGLC < AAC? |
|---|---|---|---|---|---|
| Acetaldehyde | | Annual | 4.55 | 0.095 | YES |
| | | 15-minute | 4,500 | 3.28 | |
| Acrolein | | Annual | 0.35 | 0.16 | YES |

| | | | | | |
|---|---|---|---|---|---|
| | | 15-minute | 23 | 5.73 | |
| Arsenic | | Annual | 0.000233 | **0.000404** | NO |
| | | 15-minute | 0.2 | 0.028 | |
| Chromium VI | | Annual | 0.000083 | 0.000064 | YES |
| | | 15-minute | 10 | 0.0044 | |
| Formaldehyde | | Annual | 1.1 | 6.87 | YES |
| | | 15-minute | 245 | 0.29 | |
| Hydrogen Chloride | | Annual | 20 | 9.06 | YES |
| | | 15-minute | 700 | 18.29 | |
| Methanol | | Annual | 20,000 | 0.35 | YES |
| | | 15-minute | 32,800 | 24.14 | |
| Phenol | | Annual | 45.2 | 1.17 | YES |
| | | 15-minute | 6,000 | 6.26 | YES |

To demonstrate compliance with the Georgia Air Toxics Guideline, a site-specific risk assessment (SSRA) was required to be performed for arsenic using AERMOD dispersion modeling. A business area risk assessment was performed by modeling the MGLC of each pollutant at six nearby businesses; since the facility operates for 24 hours a day, the modeled concentrations were compared to alternative 24-hour AAC values for arsenic. The most conservative result is shown in Table 6.

**Table 6: TAP Business Risk Assessment**

| Pollutant | Averaging Period | AAC ($\mu g/m^3$) | MGLC ($\mu g/m^3$) | Business Receptor ID | MGLC < AAC? |
|---|---|---|---|---|---|
| Arsenic | 24-hour | 0.0111 | 0.0014 | B1 | YES |

An SSRA also requires a residential risk analysis to be performed on the nearest residential area. The modeled concentration of arsenic was compared to its corresponding AAC value, and the most conservative result is shown in Table 7.

**Table 7: TAP Residential Risk Assessment**

| Pollutant | Averaging Period | AAC ($\mu g/m^3$) | MGLC ($\mu g/m^3$) | Business Receptor ID | MGLC < AAC? |
|---|---|---|---|---|---|
| Arsenic | Annual | 0.000233 | 0.000218 | R1 | YES |

At each of the businesses, the highest modeled concentration of each pollutant was below its associated 24-hour AAC. Additionally, the highest modeled concentration of arsenic was below its associated annual AAC at all points within the nearest residential area. Therefore, arsenic levels comply with the Georgia Air Toxics Guidelines. Visual representations of the modeled MGLCs for arsenic are shown in Figures 1 and 2, overlaid on a satellite image of the facility and the surrounding areas.

**Figure 1: Modeled 24-hour MGLC for Arsenic (for 6 nearby business receptors)**

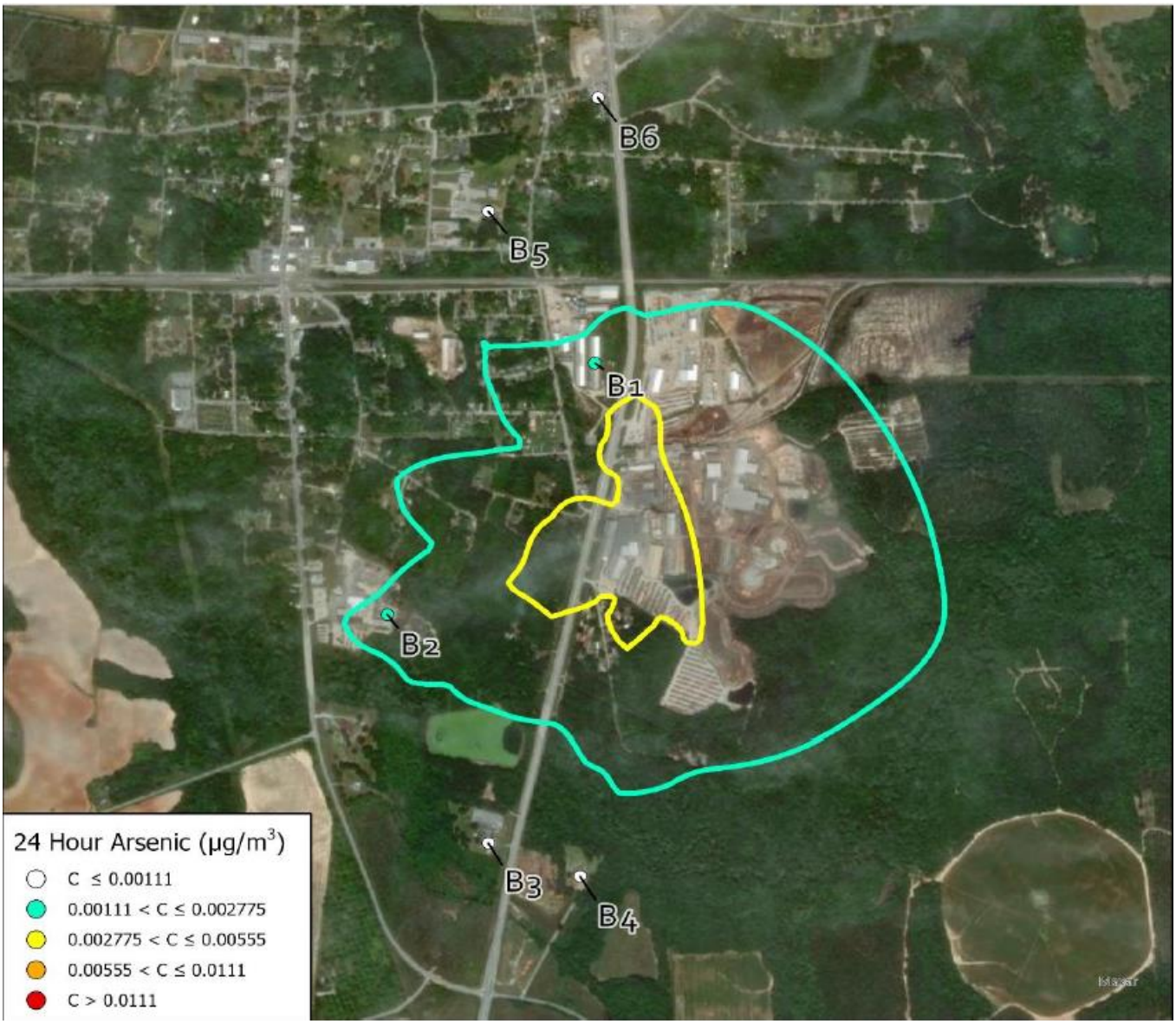
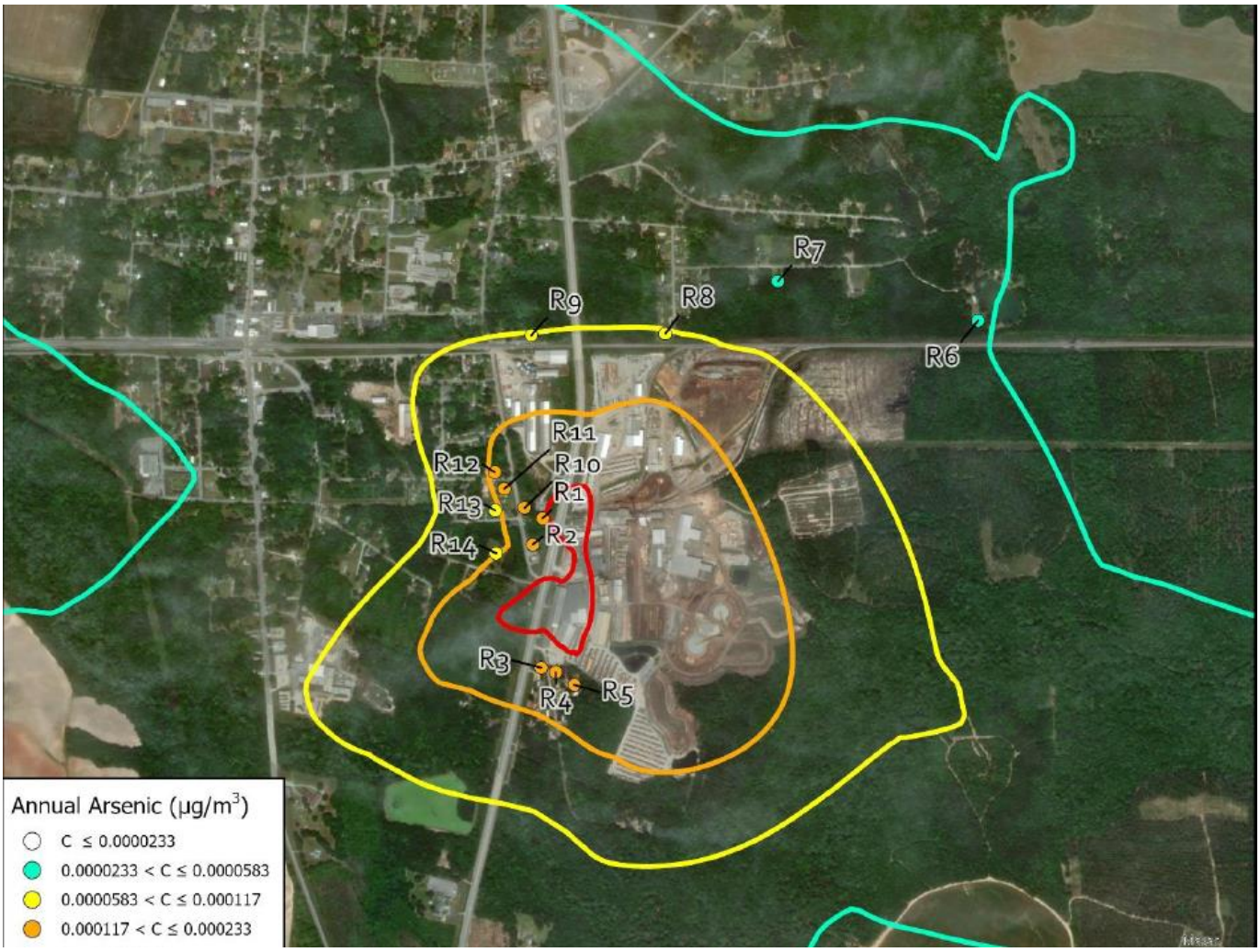


**Figure 2: Modeled Annual MGLC for Arsenic (for 14 residential receptors)**




## Summary & Recommendations

Battle Lumber Company operates a lumber mill in Wadley, GA. The facility is currently a synthetic minor source, but after the proposed modification, the facility will become a Title V major source of CO, PM, and VOC. The facility will operate with kiln throughput limits of 71 MMbf/yr for pine (softwood) lumber and 148.5 MMbf/yr for hardwood lumber to keep VOC emissions below 250 tpy and to keep single/combined HAP emissions below 10/25 tpy. The Stationary Source Compliance Program (SSCP) will continue to be responsible for compliance and inspection of the facility.

I recommend that Permit No. 2421-163-0012-E-04-0 be issued to Battle Lumber Company. A Public Advisory was issued for this application on October 19, 2022 and expired on November 18, 2022. No comments were received.